

## Experimental Design

- Identify...

- ① Control
- ② Randomization
- ③ Replication

### **1. CONTROL**

- effects of lurking / confounding vars.
- compare several different trts.
- control variable (placebo)  
(old trt.)  
(no trt.)

**\*2. RANDOMIZATION**

- use chance to assign exp. units to trts.
  - reduce lurking vars.
- 

How?

be able to do trt. 1      trt. 2  
Dan

Table of Random Digits:

(in book)

Calculator:

- ~~04 Mike~~
- ~~03 Meredith~~
- ~~02 Nicole~~
- ~~04 Kevin~~
- 05 Cara
- 06 Pat
- 07 Julia
- 08 Dan
- 09 Brittany
- 10 TJ

↓  
5

### 3. REPLICATION

(the expt or study)

- many times
  - on many diff. exp units
  - reduce chance of "fluke" results  
    ↳ variation in results.
- 

*Why?*

#### Statistical Significance-

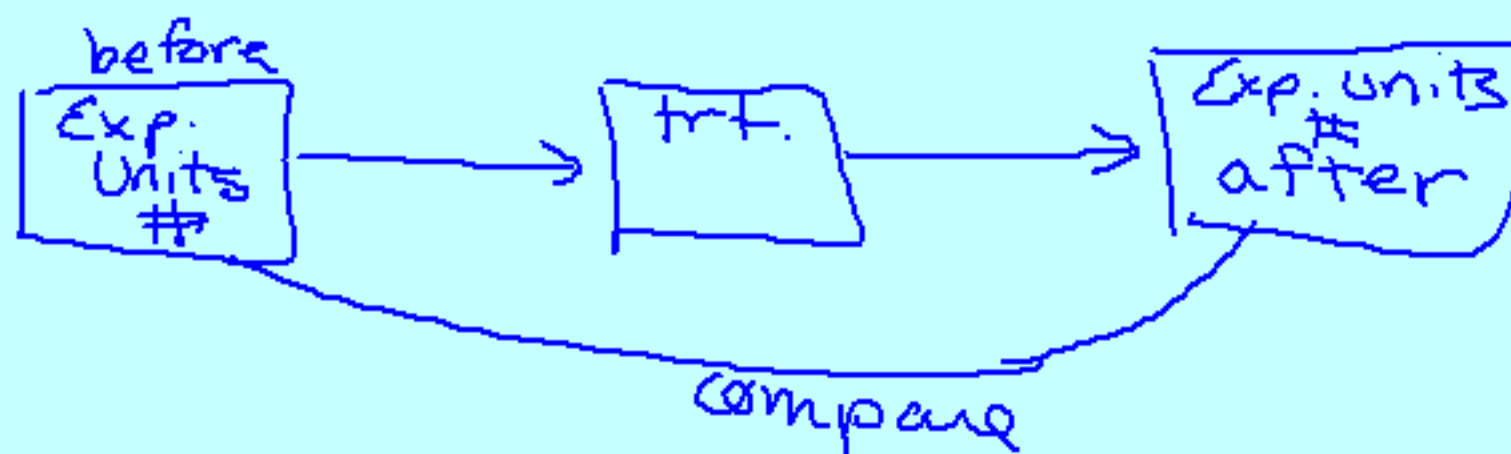
an observed result so significant (happens so often) that it would rarely occur by chance.

### Section 3.2: Experimental Design

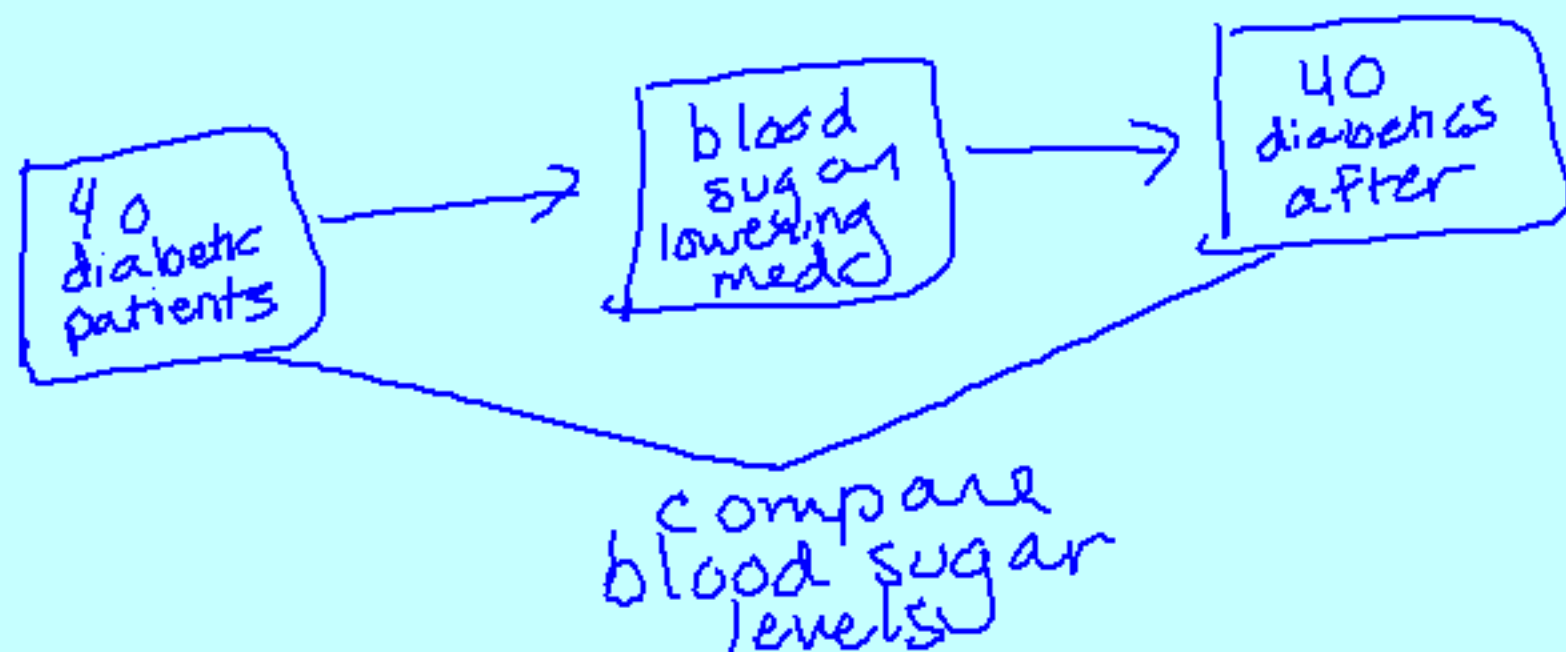
#### (1) Comparative Experiment

- a single trt. is applied to all exp. units
- measure before & after  
& compare

Design: Generic:



**Example:**



**Concerns:**

- no control group
- no randomization
- placebo effect
- bias

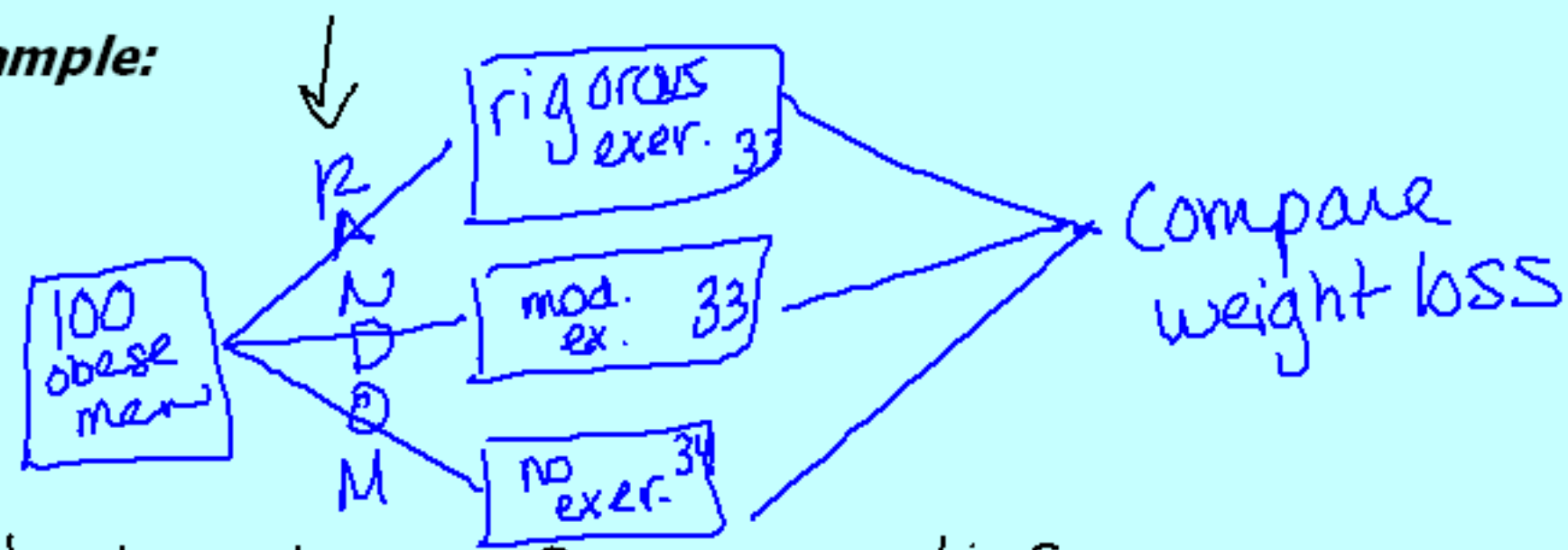
**(2) Randomized Comparative Experiment**  
**(a.k.a. Completely Randomized Design)**

- use chance to divide exp units into trt. groups
- compare trt. groups results

**Design: Generic:**



**Example:**



- diet, placebo?, genetics

**Other:**

= double blind expt.

↓  
researcher & expt unit  
doesn't know who gets  
which trt.

### ***(3) Block Design (Blocking)***

***Design: Generic:***



***Example:***

#### ***(4) Matched Pairs Design (specific type of block design)***

***Design: Generic:***

***Example:***

***Concerns:***



